

Application No. 10/069,299
Amendment dated October 31, 2003
Reply to Office Action of August 4, 2003

REMARKS/ARGUMENTS

This Amendment is responsive to the Office Action mailed August 4, 2003.

As the Examiner is aware, the U.S. application contained claims 1-7, 9-10, 14 and 16-17. Of these, only claims 1, 7 and 14 were presented in independent form. Claims 2-6 were severally dependent on independent claim 1. Claims 9 and 10 were severally dependent and claim 7. Claims 16 and 17 were severally dependent on claim 14.

The present Amendment amends independent claim 1 so as to contain the additional limitations of dependent claim 2, which now has been cancelled, and argues for the allowability of the remaining claims.

In the recent Office Action, claims 1, 3 and 5-6 were severally rejected for alleged "obviousness" over Smigerski *et al.* (U.S. Pat. No. 4,788,231), the Examining saying:

"Smigerski *et al.* disclose a tire tread comprising 100 parts diene based elastomer and filler comprising 40-250 phr carbon black and 0.1-6.5 phr zinc sulfate (col. 2, lines 38-51, col. 3, lines 26-56 and 61-62, and col. 5, line 32). Based on the amount of carbon black and zinc sulfate, it is calculated that the amount of zinc sulfate in the filler is approximately 0.04% (0.1/250) to 16 wt.% (6.5/40). Although there is no disclosure of the amount of zinc sulfate in terms of the volume percent of the filler, given that Smigerski *et al.* disclose use of small amount of zinc sulfate and large amount of carbon black, it is clear that the filler would intrinsically possess, absent evidence to the contrary, less than 30 volume% zinc sulfate as presently claimed.

The only deficiency of Smigerski *et al.* is that Smigerski *et al.* disclose the use of 6.5 phr zinc sulfate, while the present claims require 7 phr zinc sulfate.

It is apparent, however, that the instantly claimed amount of zinc sulfate and that taught by Smigerski *et al.* are so close to each other that the fact pattern is similar to the one in In re

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Woodruff, 919 F.2d 1575, [16] USPQ2d 1934 (Fed. Cir. 1990) or Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) where despite a 'slight' difference in the ranges the court held that such a difference did not 'render the claims patentable' or, alternatively, that 'a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough so that one skilled in the art would have expected them to have the same properties'.

In light of the case law cited above and given that there is only a 'slight' difference between the amount of zinc sulfate disclosed by Smigerski et al. and the amount disclosed in the present claims[,] and[,] further[,] given the fact that no criticality is disclosed in the present invention with respect to the amount of zinc sulfate, it therefore would have been obvious to one of ordinary skill in the art that the amount of zinc sulfate disclosed in the present claims is but an obvious variant of the amounts disclosed in Smigerski et al., and thereby one of ordinary skill in the art would have arrived at the claimed invention."

In response to the foregoing, claim 1 has been amended to additionally recite the substantive limitations of dependent claim 2, which has now been cancelled. The Examiner specifically indicated in paragraph 8 of the recent Office Action that claim 2 would be allowable if rewritten in independent form, provided that there is no disclosure suggestion in the Smigerski '231 patent of the particle size of zinc sulfate. The undersigned has carefully reviewed the Smigerski '231 patent, but can find no indication in that reference as to the particle size of the zinc sulfate. Accordingly, claim 1 is believed to distinguish patentably from the prior art.

As indicated above, dependent claim 2 has now been cancelled. Claims 3-6 are severally dependent on independent claim 1. Since claim 1 is believed to distinguish

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patentably from the prior art, it necessarily follows that dependent claims 3-6 must similarly so distinguish. *Ex parte Leavell*, 212 USPQ 762 (Bd. App. 1979); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

The Examiner also rejected claim 4 for alleged "obviousness" over Smigerski *et al.* '231 in view of Shimizu (U.S. Pat. No. 5,508,333), saying:

"The difference between Smigerski *et al.* and the present claimed invention is the requirement in the claims [*sic*] of silica. Shimizu, which is drawn to [a] tire tread composition, disclose[s] the use of silica filler in order to improve the fracture properties, wet grip, and rolling resistance of the tire tread (col. [16], lines 56-59).

In light of the motivation for using silica disclosed by Shimizu as described above, it therefore would have been obvious to one of ordinary skill in the art to use silica in the tire tread of Smigerski *et al.* in order to improve fracture properties, wet grip, and rolling resistance of the tire tread, and thereby arrive at the claimed invention."

As indicated above, claim 4 is a dependent claim, and is to be construed as incorporating all of the limitations of independent claim 1. Since claim 1 is believed to distinguish patentably from the prior art, claim 4 is believed to similarly so distinguish. *See, Ex parte Leavell* and *In re Fine*, both *supra*.

Claims 1 and 3-6 were further rejected for alleged "obviousness" over Shimizu (U.S. Pat. No. 5,508,333) in view of Smigerski *et al.* (U.S. Pat. No. 4,883,829), the Examiner saying:

"Shimizu discloses a tire tread comprising a tire tread comprising 100 parts diene based elastomer and 10-100 parts filler wherein the filler comprises 0.1-90 parts carbon black and 9.9-99.9 parts white filler such as barium sulfate or mixtures of barium sulfate and silica (col. 16, lines 41-col. 17, line 23 and col. 17, line 28). Based on the amount of filler and barium sul-

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fate, it is calculated that the amount of barium sulfate in the filler is approximately 9.9-99.9 wt.%. Although there is no disclosure of the amount of barium sulfate in terms of the volume percent of the filler, given that Shimizu discloses the use of [a] small amount of barium sulfate, i.e. 9.9 parts based on 100 parts filler, it is clear that the filler would intrinsically possess, absent evidence to the contrary, less than 30 volume% barium sulfate as presently claimed.

The difference between Shimizu and the present claimed invention is the requirement in the claims of zinc sulfate.

Smigerski et al., which is drawn to tire treads, disclose the equivalence and interchangeability of zinc sulfate with barium sulfate wherein these metal salts are used to prevent particle segregation during processing (col. 1, lines 47-62, col. 2, lines 20-23, col. 3, line 37, and col. 4, line 61).

In light of the disclosure of Smigerski et al. of the equivalence and interchangeability of zinc sulfate, as presently claimed, with barium sulfate, as disclosed by Shimizu, it therefore would have been obvious to one of ordinary skill in the art to use zinc sulfate in the tire tread of Shimizu in order to ensure effective processing, and thereby arrive at the claimed invention."

With all due respect to the Examiner, the principal reference cited by the Examiner, Smigerski et al. '231, specifically discloses a rubber composition containing a diene-based elastomer, and a zinc sulfate filler. Indeed, zinc sulfate is specifically mentioned in col. 3, line 56 of the Smigerski et al. '231 patent. Nevertheless, as pointed out above, claim 1 distinguishes from the Smigerski '231 by reciting that the zinc sulfate as a mean particle size from about 0.5 to about 1.0 microns. This was the original limitations set forth in dependent claim 2. That limitation has now been incorporated into claim 1. Accordingly, claim 2 has now been cancelled.

The alternative reference, Smigerski '829 also discloses a rubber compound having

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suitable metal salts, including barium sulfate and zinc sulfate. *See, e.g.*, col. 3, line 37. Thus, there is simply no need to engage in the mental gymnastics contemplated by the Examiner as to the supposed interchangeability of zinc sulfate and barium sulfate. In any event, inasmuch as the Examiner has already indicated that claim 1 would be allowable to incorporate the additional limitation of dependent claim 2, which has now been done, the Examiner's further rejection of claims 1 and 3-6 as allegedly "obvious" over Shimizu '333 in view of Smigerski '829 is now believed to be moot. As indicated above, the dependent claims are allowable for the same reasons that claim 1 is allowable. *Ex parte Leavell* and *In re Fine*, both *supra*.

The Examiner then proceed to reject claims 7 and 9-10 for alleged "obviousness" over Shimizu '333 in view of Craven (U.S. Pat. No. 3,878,147). Here, the Examiner said:

"Shimizu discloses a tire tread comprising 100 parts diene based elastomer and 10-100 parts filler wherein the filler comprises 0.1-90 parts carbon black and 9.9-99.9 parts white filler such as barium sulfate or mixtures of barium sulfate and silica (col. 16, lines 41-col. 17, line 23 and col. 17, line 28). Based on the amount of filler and barium sulfate, it is calculated that the amount of barium sulfate in the filler is approximately 9.9-99.9 wt.%. Although there is no disclosure of the amount of barium sulfate in terms of the volume percent of the filler, given that Shimizu discloses the use of [a] small amount of barium sulfate, i.e. 9.9-99.9 parts based on 100 parts filler, it is clear that the filler would intrinsically possess, absent evidence to the contrary, less than 30 volume% barium sulfate as presently claimed.

The difference between Shimizu and the present claimed invention is the requirement in the claims of the particle size of barium sulfate.

Craven, which is drawn to tire treads, disclose[s] the use of particles such as barium sulfate having particle size of 0.2-105

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microns in order to provide the necessary level of friction of the tire (col. 2, lines 8, 13, and 16-18).

In light of the motivation for using barium sulfate with particular particle size disclosed by Craven as described above, it therefore would have been obvious to one of ordinary skill in the art to use such barium sulfate in the tire tread of Shimizu in order to control the level of friction, and thereby arrive at the claimed invention."

With all due respect to the Examiner, claim 7 specifically calls for the barium sulfate particles to have a mean particle size from about 1.0 to about 2.0 microns. The "mean" is the average of the high and low values. Even if Craven does disclose barium sulfate particles in the range of 0.2-105 microns, it is pointed out that the "mean" (*i.e.*, the midpoint of the range between the extremes) particle size of barium sulfate in Craven would be about 52.51 microns, this being (*i.e.*, $0.2+105/2 = 52.51$). Thus, claim 7 does clearly distinguish from the additional teaching of Craven by reciting a mean particle size of between 1.0 and 2.0 microns, some 2-4% of that taught by Craven. Accordingly, claim 7 is believed to distinguish patentably from the Craven reference.

Moreover, claim 2 has a "mean particle size" limitation of barium sulfate that is somewhat analogous to the "mean particle size" limitation of zinc sulfate in claim 1. If the Examiner has conceded that the composition of claim 2, *i.e.*, a rubber compound having, *inter alia*, zinc sulfate particles having a "mean particle size" of from 1.0 to about 2.0 microns is patentable, then she must similarly concede that barium sulfate particles having the same "mean particle size" must also so distinguish. Clearly, this is not taught by the Craven reference.

The Examiner then rejected claims 14 and 16-17 for alleged "obviousness" over

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Young (U.S. Pat. No. 5,063,268) in view of Kuan (U.S. Pat. No. 4,237,173), saying:

"Young discloses a tire tread comprising 25-40% diene based elastomer, 20-50% carbon black, and 3-15% titanium dioxide and silica (col. 6, line 59, col. 7, line 35, col. 7, line 67-col. 8, line 1, and col. 8, lines 40-49). It is calculated from present claim 14 that the presently claimed tire tread comprises 39-77% diene based elastomer (100/260-100/130) and 23-61% filler or at least 8% titanium dioxide. Thus, the amounts disclosed by Young clearly overlap those presently claimed.

The difference between Young et al. and the present claimed invention is the requirement in the claims of the particle size of titanium dioxide.

Kuan, which is drawn to [a] tire composition, disclose[s] that controlling the particle [size] of titanium dioxide to 0.1-0.5 microns ensures ease of dispersion (col. 1, lines 44-47 and col. 2, lines 1-5).

In light of the motivation for using titanium dioxide with [the] particular size disclosed by Kuan as described above, it therefore would have been obvious to one of ordinary skill in the art to use such titanium dioxide in the tire tread of Young in order to ensure that the titanium dioxide is properly dispersed throughout the composition, and thereby arrive at the claimed invention."

With all due respect to the Examiner, independent claim 14 calls for the titanium dioxide particles to have a "mean particle size" of between about 0.5 and 1.0 microns.

With all due respect to the Examiner, the title of Kuan's invention is a "white sidewall tire". Kuan's purpose for adding titanium dioxide is simply to provide the white sidewall to the tire. Kuan does not disclose the use of titanium dioxide to make a tire tread, as claimed by applicant. Moreover, Kuan's "mean particle size" of titanium dioxide would be 0.3 microns, substantially less than the 0.5-1.0 micron range called for by claim 1.

Moreover, claim 14 further distinguishes from the Young and Kuan reference with

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respect to the amount of titanium dioxide. Young teaches 3-15% of "other filters and additives" (col. 8, lines 47-49), which may include titanium dioxide (col. 7, line 68). However, contrary to the statement of the Examiner, there is no specific teaching in Young with respect to the amount of titanium dioxide in the claimed tire tread composition.

Thus, claim 14 is believed to distinguish patentably from the prior art.

Claims 16 and 17 are severally dependent on claim 14 and are to be construed as incorporating by reference all of the limitations of that claim. Hence, claims 16 and 17 are believed to distinguish patentably in the same manner as claim 14.

This Amendment is believed to be fully responsive to the Office Action of August 4, 2003; is believed to squarely address each and every ground for objection or rejection raised by the Examiner, and is believed to materially advance the prosecution of this application toward immediate allowance.

Formal allowance of claims 1-10 is, therefore, courteously solicited.

Respectfully submitted,

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